

3-1-2008

# Workshop: Supporting the Teaching of Database Concepts with Animation Courseware

Meg Murray

*Kennesaw State University, [mcmurray@kennesaw.edu](mailto:mcmurray@kennesaw.edu)*

Mario Guimaraes

*Kennesaw State University*

Follow this and additional works at: <http://aisel.aisnet.org/sais2008>

---

## Recommended Citation

Murray, Meg and Guimaraes, Mario, "Workshop: Supporting the Teaching of Database Concepts with Animation Courseware" (2008). *SAIS 2008 Proceedings*. 10.  
<http://aisel.aisnet.org/sais2008/10>

This material is brought to you by the Southern (SAIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in SAIS 2008 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# SUPPORTING THE TEACHING OF DATABASE CONCEPTS WITH ANIMATION COURSEWARE

**Meg Murray**

Kennesaw State University  
mcmurray@kennesaw.edu

**Mario Guimaraes**

Kennesaw State University  
mguimara@kennesaw.edu

## ABSTRACT

Developing an understanding of database concepts and acquiring capabilities of using database technologies are required skills for IS graduates. However, there are many obstacles to teaching database concepts given the limited time within an IS curriculum that can be devoted to this topic. One solution is to develop thematic modules and incorporate the use of instructional software. This workshop presents an overview of a set of animated database courseware materials being developed as part of an NSF CCLI grant. Modules covered include database design, structured query language (SQL) and database transactions. The animations are being made freely available and may be accessed at <http://adbc.kennesaw.edu>.

## Keywords

Database, courseware, instructional materials

## INTRODUCTION

Information Systems programs require students to develop fundamental understanding of database concepts. Within the IS Model Curriculums [both IS2002 and the new model under development], database design and administration are listed as representative capabilities and knowledge expected of IS graduates (IS2002, 2002). The IS Model Curriculums also recommend including the incorporation of DBMS into systems design and development courses. However, there are many obstacles to teaching database concepts including prioritizing the many important database concepts, incorporating new technologies into an already full curriculum and supporting students who find the topic challenging. Database technologies include a wide range of concepts from data modeling and database design to database construction, implementation, manipulation and database administration. Each of these areas includes its own conceptual constructs and vocabulary. One solution to effectively teaching this array of material is the development of thematic modules supplemented with instructional materials. Interactive instructional materials such as animations can often be incorporated into the instructional process to enhance and enrich the standard presentation of important concepts. Further, complementary software animations can be effective at reinforcing topics introduced in the classroom as they provide a venue for practice and feedback.

Through an NSF proof-of-concept grant, we developed a series of animated tutorials and exercises, referred to as Animated Database Courseware (ADbC), that emphasize and reinforce core database concepts and skills. The ADbC currently consists of over 70 animations or tutorials categorized into three main modules (Database Design, SQL Queries and Transactional Processing) divided into 13 sub-modules.

This workshop will introduce participants to the ADbC and its application in the classroom. The modules covered will include:

- Database Design which covers scenarios to E-R diagrams, converting E-R diagrams to tables and converting functional dependencies into normalization. In addition, it presents the visualization of E-R diagrams in several different notations to complement the notation set preferred by the instructor or used in the accompany textbook.
- Structured Query Language which covers interactive SQL, SQL from within applications, and stored procedures/functions. Sub-sections within this module include an Introduction to DDL and DML, Constructing SQL Queries, Animating SQL through Procedural Code, Animating SQL through Relational Algebra and SQL Misconceptions animated through relational algebra.

- Transactions which covers the concepts of concurrency, triggers and recovery. Concurrency animations depict deadlocking, serial locking, lost update and record locking. Recovery examples illustrate physical update versus the logical update and the Triggers sub-module shows what happens to the triggering event when a trigger error occurs.

Modules within the ADbC are explicitly designed as instructional aids to supplement classroom teaching. They are independent of any database text or database product. The development of each module follows a development cycle that begins with identifying the desired student learning outcomes, creating scenarios mapped to those outcomes, developing a prototype for each scenario, testing and evaluation of the prototype and finally implementation. As each prototype is completed, it is made publicly available through the ADbC web site and user feedback is solicited.

The workshop will demonstrate ways to incorporate the animations into courses which teach database concepts, either as the total focus of the course or as one component. This will be an interactive session and participants will be asked to provide comments and feedback and suggestions for refining the current animations. Another objective of this workshop is to create a network of interested database instructors that desire to share ideas with the goal of improving database instruction. Courseware prototypes have been made freely available and may be found at <http://adbc.kennesaw.edu>.

The ADbC project is envisioned to be an ongoing project that uses an iterative process for refinement and further development of visualizations and animations to support the teaching of database content areas. Through work in the proof-of-concept phase of the NSF grant, additional areas for expansion were identified. These include a module on database security as well as modules on the advanced database topics of data warehousing, data exchange via XML, and database system architecture, performance and tuning. Participant input for suggestions on requirements for future modules will be solicited.

## REFERENCES

1. Animated Database Courseware (ADbC). Available online : <http://adbc.kennesaw.edu>.
2. IS 2002 Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems. (2002). Association for Information Systems. Available online: <http://www.aisnet.org/Curriculum/#curriculum>.